

What is claimed is:

1. A well-logging data acquisition system comprising:
  - at least one well-logging instrument having at least a first and a second pressure sensor;
  - 5 a central processing unit (CPU) connected to the well-logging instrument via a telemetry system cable and a storage system connected to the central processing unit and having:
    - 10 a depth correction logic means operable to instruct the CPU to compute a corrected depth from pressure readings of the first and second pressure sensors.
2. The well-logging data acquisition system of Claim 1 the first and second pressure sensors are located a known distance apart.
- 15 3. The well-logging data acquisition system of Claim 1 wherein the depth correction logic means comprises:
  - 20 a logic to compare a second pressure observed by the second pressure sensor to pressures previously recorded by the first pressure sensor and setting a corrected depth index based on a location of the well-logging instrument when the first pressure sensor recorded a pressure substantially equal to the second pressure.
4. The well-logging data acquisition system of Claim 1 wherein the depth correction logic means comprises:
  - 25 a logic to calculate and record corrected depth values having instructions to make an entry for each measurement taken

including a first pressure recorded by the first pressure sensor  
and a second pressure recorded by the second pressure sensor,  
and a corrected depth value determined by

if moving in the direction of the first pressure sensor, setting the

corrected depth of a current entry by subtracting the  
distance between the two pressure sensors from the  
corrected depth when the first pressure sensor had  
recorded a pressure value substantially equal to the  
pressure observed by the second pressure sensor, or

if moving in the direction of the second pressure sensor, setting  
the corrected depth of the current entry by adding the  
distance between the two pressure sensors to the  
corrected depth when the second pressure sensor had  
recorded a pressure value substantially equal to the  
pressure observed by the first pressure sensor for the  
current entry.

5. The well-logging data acquisition system of Claim 4 wherein the depth  
correction logic further comprises instructions to:

set the corrected depth of a current entry to the corrected depth of the  
preceding entry if at least one of the pressure sensors indicates  
no change in pressure from the preceding entry to the current  
entry.

6. The well-logging data acquisition system of Claim 4 wherein the depth  
correction logic further comprises instructions to:

set the corrected depth of a current entry to the corrected depth of the  
preceding entry if both of the pressure sensors indicate no  
change in pressure from the preceding entry to the current  
entry.

- 5 7. The well-logging data acquisition system of Claim 4 wherein the depth correction logic means further comprises instructions to receive an observed pressure from a pressure sensor, look up the observed pressure to find a depth value associated with the observed pressure, and set a corrected depth for other measurements made at the same time to be the depth value associated with the observed pressure.
- 10 8. The well-logging data acquisition system of Claim 1 wherein the depth correction logic means comprises instructions to set a corrected depth equal to a depth previously recorded depth when the pressure of a first sensor equaled the current pressure observed by a second sensor.
9. The well-logging data acquisition system of Claim 1 wherein the depth correction logic means further comprises instructions to initialize a table of corrected depth values based on a known section of a borehole.
- 15 10. A method for determining a corrected depth value in a well-logging operation comprising:
- for each measurement taken collecting a first pressure using a first pressure sensor and a second pressure using a second pressure sensor wherein the first pressure and the second pressure are collected at a known distance from one another;
- 20 comparing the first pressure to previously recorded values for the second pressure; and
- setting a corrected depth value to be a previously recorded depth value corresponding to an entry in which a previously recorded value for the second pressure is substantially equal to the first pressure adjusted for the distance between the first pressure sensor and the second pressure sensor.
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11. A method for determining a depth value in a well-logging operation comprising:

- 5           a. determining the pressure of a second pressure sensor at a known depth in a borehole, setting a second pressure variable equal to that pressure, and setting a current depth variable equal to the known depth;
- b. moving a well-logging instrument to a location wherein a first pressure sensor observes a pressure substantially equal to the second pressure variable;
- 10          c. adding the distance between the first and second pressure sensor to the current depth variable, and setting the second pressure variable equal to the pressure observed by the second pressure sensor after step b; and
- 15          d. repeating steps b and c until a desired depth has been reached or a desired condition has been met.

12. A well-logging data acquisition system comprising:

- 20           at least one well-logging instrument having at least a first and a second sensor for measuring a physical quantity wherein each such sensor measures the same physical quantity;
- a central processing unit (CPU) connected to the well-logging instrument via a telemetry system cable and a storage system connected to the central processing unit and having:
- 25           a depth correction logic means operable to instruct the CPU to compute a corrected depth from sensor readings of the first and second sensors measuring the same physical quantity.

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13. The well-logging data acquisition system of Claim 12 wherein the physical quantity is pressure and the first and second sensors are pressure sensors.

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14. The well-logging data acquisition system of Claim 12 wherein the physical quantity is pressure and the first and second sensors are pressure sensors.

15. The well-logging data acquisition system of Claim 12 wherein the first and second sensors are separated from one another by a known distance.